**REPORT on Northern Weddell Sea and Western Antarctic Peninsula**
**Date: 26/02/2025**

**CSIC-UNESPA Antarctic Expedition on board the Australis research support vessel**

## Objective

Determine the presence of the high pathogenicity avian influenza (HPAI) virus H5N1 in Antarctica. In 2024 this virus was detected at different locations in the Antarctic region in birds and marine mammals. The Expedition is visiting different sites to monitor signs of infection and to take samples from live and dead animals. This report focuses on the sites sampled in the Northern Weddell Sea and Western Antarctic Peninsula.

## METHODOLOGY

An inspection of the site was carried out to identify unusual mortality or signs of infection. Samples were taken from carcasses (brain and lung) and live animals (oropharyngeal and cloacal swabs). RT-qPCR was performed for the identification of the M and H5 genes of influenza A virus. Confirmation of HPAI virus was done by sequencing the multibasic cleavage site with the Oxford Nanopore sequencing technology (MinION).

Air samples were collected from penguin colonies with an air pump attached to a nanofiber filter that captures viruses. RT-qPCR was carried out to detect the virus.

## RESULTS

The Table shows the dead or alive animal species, and air samples, found to be positive for both matrix (M) gene (Flu+) and H5 gene (H5+) for influenza A virus at each site. The presence of HPAI virus was confirmed by sequencing of the multibasic cleavage site in at least one animal for each species at each site.

The Figure shows the location and number of H5+ animals detected.

## CONCLUSIONS

The initial results generated on site confirm the presence of H5 influenza virus in **188 animals** distributed through the Northern Weddell Sea and Western Antarctic Peninsula. Sequencing of the multibasic cleavage site in **70 selected animals demonstrated that the H5+ virus was HPAI in each positive animal species at each site.**

The virus was detected in **13 animal species**, comprising 9 birds (Adelie penguin, chinstrap penguin, gentoo penguin, Antarctic shag, kelp gull, skua, snowy sheathbill, Southern fulmar, Southern giant petrel) and 4 mammals (Antarctic fur seal, crabeater seal, Weddell seal and leopard seal).

H5 influenza virus was detected in 50% of the carcasses tested, which strongly suggests that the virus is causing significant mortality in various species in the Antarctic Peninsula, especially skuas. In many cases the viral load in dead animals was very high, indicating a potential risk of exposure to the virus in the proximity of the carcasses.

The virus does not appear to be causing mass mortality in the colonies of Adelie, gentoo and chinstrap penguins visited, but the virus was detected in live penguins, showing that the virus may be circulating in apparently healthy colonies. Similarly, the virus was found in live animals from several other species tested, including flying birds and pinnipeds.

Air sampling has identified the H5 influenza virus in the air of penguin colonies with high prevalence of the virus in live animals. This method therefore represents a valid methodology for detection of the virus without the need to manipulate animals.

In summary, we demonstrate the widespread distribution of HPAI virus in 24 out of 27 sites visited in the Antarctic Peninsula area, infecting 13 species of birds and pinnipeds. The finding of HPAI virus in apparently healthy live animals shows current circulation of the virus. This has implications for human safety since many of these sites are frequently visited by tourism vessels and scientists.

Antonio Alcamí
CSIC-UNESPA Antarctic Expedition

The Expedition is funded by UNESPA (Asociación Empresarial del Seguro) and CSIC (Consejo Superior de Investigaciones Científicas).

**Participating institutions:** Centro de Biología Molecular Severo Ochoa (CSIC), Laboratório de Patologia Comparada de Animais Selvagensm, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo (LAPCOM/FMVZ-USP), Karen C. Drayer Wildlife Health Center, One Health Institute, School of Veterinary Medicine, University of California – Davis (UC Davis), Instituto de Mamíferos Aquáticos (IMA), and Ocean Expeditions.

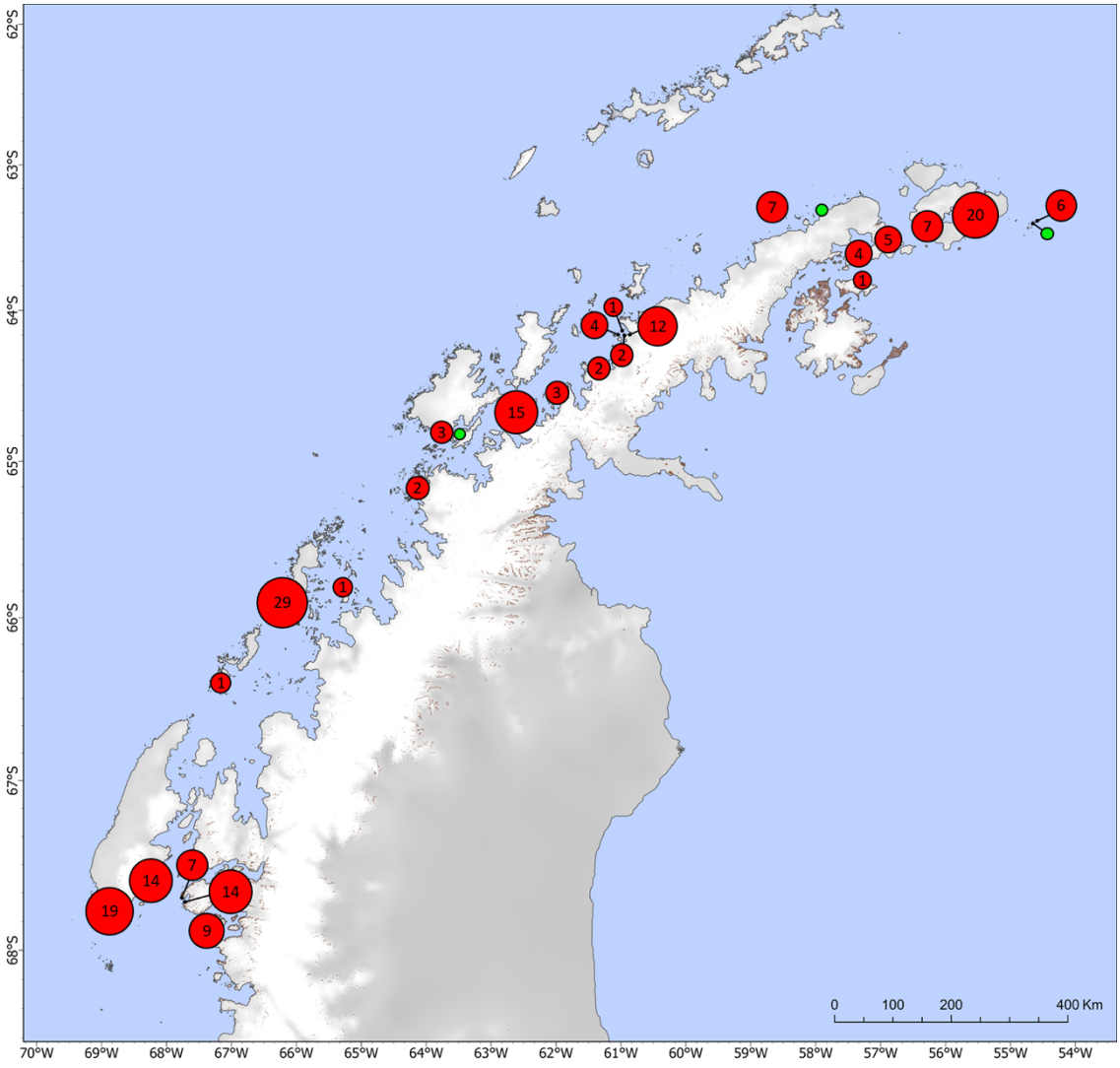


***Figure. Distribution of H5 influenza virus detections. HPAI virus was demonstrated in each H5+ animal species at each site. Study sites (red circles) are drawn proportionally to the number of H5+ cases detected (numbers shown). Green circles represent visited sites where no H5+ virus was detected.***

| Site | Date | Adelie penguin | Chinstrap penguin | Gentoo penguin | Kelp gull | Skua | Antarctic shag | Southern giant petrel | Snowy sheatbill | Southern fulmar | Crabeater seal | Antarctic fur seal | Weddell seal | Leopard seal | Air samples | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D'Urville Monument (63.4272 S, 56.2868 W) | 21/01/25 | A+ D+ | | D+ | D+ | | | | | | | | | | | 7 |
| Tay Head (63.3500 S, 55.5666 W) | 22/01/25 23/01/25 | A+ D+ | | | D+ | A+ D+ | | | D+ | | D+ | | | | | 20 |
| Heroina Island (63.3951 S, 54.6080 W) | 23/01/25 24/01/25 | A+ D+ | | | | | | | | | | | | | + | 6 |
| Beagle Island (63.4164 S, 54.6669 W) | 25/01/25 | | | | | | | | | | | | | | | 0 |
| Beak Island (63.6110 S, 57.3477 W) | 26/01/25 | | | | | D+ | | | | | | | | | | 4 |
| Devil Island (63.7988 S, 57.2884 W) | 27/01/25 | A+ | | | | | | | | | | | | | | 1 |
| Brown Bluff (63.5202 S, 56.9091 W) | 29/01/25 | A+ | | A+ | D+ | | | | | | | | | | | 5 |
| Kopaitic Island (63.3132 S, 57.9114 W) | 30/01/25 | | | | | | | | | | | | | | | 0 |
| Astrolabe Island (63.2954 S, 58.6712 W) | 31/01/25 | | A+ | | D+ | | D+ | | | | | A+ D+ | A+ | | | 7 |
| Pingüino Island (64.1433 S, 60.9865 W) | 01/02/25 02/02/25 | | | | | D+ | | | | | | | | | | 1 |
| Cierva Point (63.1590 S, 60.9595 W) | 02/02/25 | | | | | D+ | | | | | | | | | | 2 |
| Moss Islands (64.1655 S, 61.0401 W) | 03/02/2025 | | | | | D+ | | A+ D+ | | | | | | | | 4 |
| Cierva Cove (64.1634 S, 60.9194 W) | 03/02/2025 | | | | D+ | D+ | | | | | | | | | | 12 |

| Site | Date | Adelie penguin | Chinstrap penguin | Gentoo penguin | Kelp gull | Skua | Antarctic shag | Southern giant petrel | Snowy sheatbill | Southern fulmar | Crabeater seal | Antarctic fur seal | Weddell seal | Leopard seal | Air samples | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hughes Bay (64.3896 S, 61.3494 W) | 04/02/2025 | | | | | | | | | | A+ | | | | | 2 |
| Foyn Harbour (64.5533 S, 61.9954 W) | 04/02/2025 | | | | | | | | | | D+ | | A+ | | | 3 |
| Curverville Island (64.6847 S, 62.6303 W) | 05/02/2025 | | | A+ D+ | D+ | D+ | | | | | | | | | + | 15 |
| Petermann Island (65.1759 S, 64.1409 W) | 06/02/2025 | | | | | D+ | | | | | | | | A+ | + | 2 |
| Grandidier Channel (65.7730 S, 65.1610 W) | 07/02/2025 | | | | | | | | | | A+ | | | | | 1 |
| Armstrong Reef (65.8882 S, 66.2024 W) | 08/02/2025 | A+ D+ | | | D+ | D+ | A+ | A+ | | | | | | | | 29 |
| Avian Island (67.7715 S, 68.8843 W) | 10/02/2025 11/02/2025 | D+ | | | D+ | D+ | A+ D+ | A+ | | | | | A+ | | | 19 |
| Bongrain Point (Pourquoi Pas Island) (67.7233 S, 67.7354 W) | 12/02/2025 | | | | | D+ | | | | D+ | | | | | | 14 |
| Lainez Point (Pourquoi Pas Island) (67.6994 S, 67.7687 W) | 12/02/2025 | | | | D+ | D+ | D+ | A+ | | | D+ | | | | | 7 |
| Lagotellerie Island (67.8892 S, 67.3804 W) | 13/02/2025 14/02/2025 | A+ D+ | | | | D+ | A+ D+ | | | | | | | | | 9 |
| West Lagoon Island (67.594 S, 68.246 W) | 15/02/2025 | | | | D+ | D+ | | | | | | | | | | 14 |
| Kuno Point Islet (Watkins Island) (66.4040 S, 67.1723 W) | 16/02/2025 | | | | | | D+ | | | | | | | | | 1 |

| Site | Date | Adelie penguin | Chinstrap penguin | Gentoo penguin | Kelp gull | Skua | Antarctic shag | Southern giant petrel | Snowy sheatbill | Southern fulmar | Crabeater seal | Antarctic fur seal | Weddell seal | Leopard seal | Air samples | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biscoe Point (Anvers Island) (64.8122 S, 63.7716 W) | 18/02/2025 | | | | | **D+** | | | | | | | | | | **3** |
| Port Lockroy (Goudier Island) (64.8251 S, 63.4938 W) | 19/02/2025 | | | | | | | | | | | | | | | **0** |

Note: “A+” and “D+” indicate H5 influenza virus detection in alive and deceased individuals, respectively. The air samples positive for M and H5 (Flu+ H5+) are shown.